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ABSTRACT

The Literacy for Employability (LitE) project was conducted from May 1, 1991 through January 31, 1993. The project was intended to upgrade the mathematics, writing, and problem-solving skills of employees at three Austin, Texas, companies: Hart Graphics, IBM, and Texas Instruments. At Hart and Texas, the program was mandatory; at IBM it was voluntary. During the program, an advisory committee of educators and company representatives was formed, a needs assessment of employee skills was conducted, and curriculum materials focusing on applied basic skills and higher-level thinking skills were developed using the functional context approach. A total of 134 employees of the 3 companies were instructed using the 5 modules developed. Program administrators, company officials, and students who attended the classes thought the program was valuable and that the students had learned many skills they were applying on the job. There were highly significant differences in accident rates: at all three companies, nonparticipants had more on-the-job injuries than did participants. The 11-month duration of the instructional phase of the program was longer than most "quick-fix" programs and allowed enough time for real learning to take place. (Two appendices contain a project promotional brochure and participant certificates of achievement.) (KC)

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PERFORMANCE REPORT

WORKPLACE APPLICATIONS OF BASIC SKILLS IN HIGH TECH PRODUCTION LINE ENVIRONMENT

--LITERACY FOR EMPLOYABILITY (LitE)--

Project Number V198A10217

Elaine Shelton

Under grant from the U. S. Department of Education
National Workplace Literacy Program
to
The University of Texas at Austin
Extension Instruction and Materials Center
Educational Resources
Division of Continuing Education

April 30, 1993

U.S. DEPARTMENT OF EDUCATION
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Literacy for Employability (LitE) Project
Performance Report

> ***This project ranks as one of the finest workplace literacy projects this evaluator has investigated in the past ten years. Its well thought-out design, careful management and attention to detail, dedication to cooperative efforts among all collaborating parties, and constant striving to override somewhat unpredictable circumstances on a daily basis in the common interest of meeting stated goals are exemplary practices that other projects would be prudent to emulate.***
>
> – Jorie Philippi
> External Evaluator

The Literacy for Employability (LitE) Project began on May 1, 1991, and continued, thanks to two no-cost time extensions, until January 31, 1993. If, at any point during the first seven months of the twenty-one month project, anyone would have tried to tell me that the quote above would be the concluding remark of our external evaluator's written report, I would have thought him or her demented. After the initial crisis-plagued, anxiety-ridden seven months, however, this project began to settle into the effective educational experience that we had dared to envision when we set out to write the grant application.

In this final report, I will attempt to enumerate some of the reasons for the horrors of the first seven months as well as describe the successes of the ensuing fourteen months.

The format that I will follow in this report will be to compare the accomplishments of this project with the objectives contained in our approved proposal.

Goal I: To establish and meet with an advisory committee for workplace literacy as addressed by the LitE project.

Objective I: Identify and meet with members of the Project LitE Advisory Committee.

The wording of this first objective brings up a point I would like to make before discussing the Advisory Committee. When we wrote our grant application, we thought "Project LitE" said it well–ours was to be a functional literacy program for enhanced employability–hence, the "Literacy for Employability" Project.

Although the name of our project remained Literacy for Employability (Project LitE) for purposes of DOE reporting, we, in consultation with our advisory committee (the committee's first order of business at our first meeting, actually), changed the working name of our project to "Skills Building for Tomorrow." We all agreed that the term "literacy" had too much negative baggage associated with it. Too many times persons who are said to need a literacy program feel that they, then, must be illiterate. This case was particularly untrue in our program because our materials and program are targeted to intermediate skill-level workers.

Our program underwent one additional name change to arrive at our final title. Even though "Skills Building for Tomorrow" is a fine name for an instructional program, for marketing purposes, it does not clearly reflect the content of the program. Thus, we titled our curriculum ***The Competitive Edge: Sharpening Your Skills in the Workplace.*** We have already received much positive feedback from educators and business trainers alike on our selection of a title.

With this historical perspective, we will proceed to the first objective of our project, the establishment of an advisory committee.

We immediately established an advisory committee made up of the Project LitE Director, EIMC Director of Educational Resources, all four Project LitE instructor/curriculum developers, the Executive Director of the Austin/Travis County Private Industry Council (our business partner), and several representatives from each of our three business sites (5 from IBM, 3 from Texas Instruments, and 3 from Hart Graphics).

A complete list of the members of the project's advisory committee is included as ***Appendix A*** of this report.

We began the project by having monthly advisory committee meetings. Given the many details inherent in a new project and our desire to involve the committee members as much as possible (and their interest in doing so), we believed that monthly meetings for the first seven months were necessary. However, once the start-up phase of the project was completed and the routine of classes had begun, we all agreed that meeting every other month was sufficient.

Of the eighteen members of the advisory committee, at least twelve participated in each meeting which, given the extraordinarily busy schedules of our three business site representatives, showed a high level of interest and commitment. Commitment was also evidenced by the fact that each company expended more than the 30% matching funds required as a condition of the DOE grant by (1) providing 100% release time for all of their employees who participated in our yearlong program, (2) providing onsite space in which to hold our classes, and (3) investing considerable time attending advisory committee meetings, consulting over the phone, and taking part in additional meetings throughout the year. Copies of these matching reports are included as ***Appendix B*** to this report. Further documentation of the match is being sent separately with the required Final Financial Report from the University's accounting department.

The one change I would make in the future, when working with more than one company, would be to meet with representatives of each company separately. We enjoyed good working relationships with each of the companies and their representatives, but the dynamics changed when representatives of all three companies met together. The tone became less cooperative and took on more of an "us" versus "them" atmosphere, with the education community on one side of some issues and the business community on the "other" side. Granted each group (academic and business) learned much from each other throughout the project, but the learning was accomplished in a less stressful manner outside of the full committee meetings.

By far the hottest area of controversy when these battle lines were drawn was over the issue of confidentiality of assessment information.

Even before the project began, in preliminary discussions with each of the three companies, we verbally and in writing stated our position that under no circumstances would individual or small group scores or information on progress be given to any representatives of the companies.

This became an issue only after the companies realized that once our project was over, some of the participants conceivably might still need instruction. The companies contended that only by knowing which employees needed further instruction could the companies provide for them.

We understood their point and felt it to be valid. The problem was twofold for us. First, the Department of Education (DOE) and The University of Texas were sensitive to the liabilities to which they could be subject if a participant felt that he/she was denied continued employment, promotion, salary increase, or satisfactory performance appraisal based on assessment scores or progress in class. Second, we had promised the employees when they came in for the initial assessment, and subsequently into our classes, that in no way would their performance on the assessment or in class reflect negatively on their opportunities for retention, promotion, or in their performance appraisals and that only staff at the University would have access to their scores and performance information.

The members of the advisory committee had some very heated debates over this issue over many months. Complicating the situation, two of the three companies were experiencing layoffs at the very time we were assessing and providing classes, so a very understandable paranoia level was much in evidence among our students. Given this climate and the position of the Department of Education that in no way should the program be perceived as threatening to job security, we felt secure that our stand was correct because of the potential legal ramifications to releasing performance information which we had been made aware of by the DOE and our ethical commitment to keep our initial word to our students.

Goal II: To research the workplace literacy needs of job areas at Hart Graphics, IBM, and TI

Objective IIa: Identify jobs for which basic workplace skills training is needed.

We accomplished this objective by meeting with the training directors at each company as well as interviewing the supervisors of the targeted departments.

Objective IIb: Conduct a literacy task analysis for targeted jobs to determine job tasks and corresponding literacy skills needed to perform these jobs well.

We accomplished this objective but, in doing so, learned valuable information that was put to use later in conducting future task analyses after our grant ended.

The advice we received from the consultant who had trained us in how to conduct task analyses was to ask to observe three exemplary workers for each job type so that we could see how a particular job should be done. We found it just as valuable, if not even more so, to observe at least one employee who was not highly proficient in doing a job. While watching those employees, our instructors were able to see what weaknesses were in evidence, what skills needed to be strengthened, and what types of problems were leading to difficulties with a task. Initially observing proficient employees is necessary, of course, but we found it far better to first observe one or two proficient employees and then observe one or two less than exemplary ones. Hence, when asking to observe employees, we believe it best to take the "cards" (employees) that are dealt rather than requesting to see only exemplary workers for each job.

Goal III: Develop curriculum materials focusing on applied basic skills and higher level thinking skills that will be used in a workplace literacy program for job tasks identified at the three work sites.

Objective IIIa: Write a competency-based and functional literacy curriculum for the targeted jobs.

Based on the information gained from the comprehensive task analyses we conducted, we accomplished this objective in a manner of which we are very proud. With a copy of this final report, we are sending one complete set of our curriculum materials, under separate cover, to our Program Officer, Sarah Newcomb.

As initially written, our curriculum was divided into the following five modules that, in turn, were divided into the following lessons.

Module 1: Refresher Math

Lessons:

* *Adding and Subtracting Decimals
* * Multiplying Decimals
* * Dividing with Decimals
* *Using Fractions: Adding, Subtracting, and Reducing to Lowest Terms
* * Finding Common Denominators
* * Multiplying and Dividing Fractions
* * Fractions and Decimals

Module 2: Accessing Information Through Reading

Lessons:

* * Reading Strategies
* * Locating Information Quickly
* * Paraphrasing Information
* * Following Instructions
* * Writing Instructions
* * Improving Recall
* * Working with Tables and Graphs
* * Analyzing Information (Part 1 and Part 2)

Module 3: Advanced Math

Lessons:

* * Solving Word Problems
* * Estimating and Averaging
* * Working with Ratios
* * Working with Proportions
* * Converting Fractions and Decimals into Percents
* * Solving Percent Problems
* * Standard Measurement (Part 1 and Part 2)
* * Metric Measurement
* * Adding and Subtracting Signed Numbers
* * Multiplying and Dividing Signed Numbers
* * Algebraic Equations and Inequalities
* * Addition and Subtraction, Solving for an Unknown
* * Multiplication and Division, Solving for an Unknown
* * Working with Formulas
* * Graphing Ordered Pairs

Module 4: Decision Making, Problem Solving, and Team Building
Lessons:

* Thinking Creatively
* Thinking Things Through
* Team Building
* Introduction to Team Processes
* The Problem
* The Decision
* Negotiation
* Applying Problem-Solving Skills

Module 5: Oral and Written Communication
Lessons:

* Sending Clear Messages
* Listening for Understanding
* Dealing with Difficult Situations
* Introduction to Writing
* Writing Memos
* Applying for Opportunities
* Writing to Request
* Writing to Return or Show Concern

What is critical to emphasize is that each of the skills addressed in each of the lessons was imbedded in a **functional workplace context**.

The lessons were thoroughly field-tested in yearlong classes at all three business sites. Classes met twice a week for two hours at a time (a total of four hours per week) over eleven months with the same group of students. The breakdown of contact hours by module follows.

Module 1: 5 weeks = 20 hours of instruction
Module 2: 9 weeks = 36 hours of instruction
Module 3: 16 weeks = 64 hours of instruction
Module 4: 5 weeks = 20 hours of instruction
Module 5: 5 weeks = 20 hours of instruction

TOTALS: 40 weeks = 160 hours of instruction per participant

The program was expanded beyond the 40 weeks of instruction to include a one-week break between Modules 1 and 2 and within Module 3, as well as a two-week break over Christmas.

The arrangement of having the four instructors in our project double as the curriculum developers was truly ideal. Because they were in classes field-testing the materials they developed, they had an incomparable perspective on what worked, what did not, and why. They were then in the position of being able to make the revisions necessary to improve the curriculum materials.

One of the challenges faced by the developers was how best to provide examples and activities that were specific enough to be judged relevant and immediately useful to the work in which our two high tech companies were engaged (IBM and TI) and, at the same time, to come up with examples and activities to which the bindery workers at Hart Graphics could relate as well as the unknown workers who would be the recipients of our materials once they were advertised nationwide. We feel that we have produced a product that meets these goals nicely. The easy-to-use format readily lends itself to adaptation to the special needs of businesses with diverse needs and wants.

The development team made extensive revisions to the content and format of almost all the lessons before honing it to our final product. This final product is a set of the following five books:

Math Student Edition (286 pp)
Communications Student Edition (270 pp)
Math Instructor's Guide (342 pp)
Communications Instructor's Guide (302 pp)
Administrator's Guide (44 pp)

The Student Editions feature:

* Functional workplace context
* Discrete modules, each containing daily lessons
* Stated learning objective for each lesson
* Vocabulary sections for terms that need explanation
* Numerous practice problems
* Lesson supplements ("Tools of the Trade") that include practice reviews on grammar, spelling, and more
* Visual cues for recurring lesson segments provided by icons
* Answer Key at the back of the book

The Instructor's Guides feature:

* Complete text (page-by-page) of corresponding Student Edition
* Answers within text
* Teaching suggestions ("Memos to the Teacher") before each lesson
* Assessment instruments (Pre- and Posttests for Math and three Reviews in Math book)

The Administrator's Guide was not a product that we had envisioned until the project was well under way. The more experience we gained, the more we realized how helpful it would be for other persons wanting to begin, or to begin thinking about, a workplace education program. Thus, we wrote this guide to be a step-by-step reference for how to plan and carry out a workplace skills enhancement program. We even were so brave as to include a timeline for the fourteen steps, with the clear admonition that these were approximations and not always in sync with the realities of each unique set of circumstances encountered with each distinct program/company.

We have copyrighted all of the aforementioned materials and are prepared to market both our curriculum and our technical assistance via, among other methods, a newly developed promotional brochure that is included as *Appendix C*.

In conjunction with the earlier statement regarding the positive feedback we have already received on our choice of a title for our curriculum, the same is true for the artwork contained in our publications. We want to go on record in this final report as saying that our contention in our original budget that a great deal of time would be required by both our in-house editor, artist, and publishing technician was accurate and conservative. One of the debates we had during one of our first telephone negotiations with our DOE budget officer was her doubting that we even needed an artist/illustrator. Only after we explained that, for the audience we were targeting, illustrations were extremely important, did she acknowledge that we could keep a very small amount of money in our budget for an artist/illustrator. The reality of the situation is that the services of our editor, artist/illustrator, and publishing technician who inputted every word of our books into a computer were grossly underestimated in our budgeted allocation of their time actually spent on this project.

I recommend, based on this experience, that an effort be made to sensitize the budget officers who are charged with negotiating final budgets with the grantees to the fact that not all grantees have "padded" their line items, (in anticipation of having their budget requests cut) and that grant writers have expertise in knowing their field, their target population's needs, and the resources that are genuinely needed in order to best meet these needs.

Our projected timelines for beginning instruction were delayed for two major reasons. One reason, which will be discussed below, was the amount of time needed for program start-up. The second reason was economy-related and business-related concerns and delays.

The three months given for start-up activities was simply not sufficient for us to be ready to deliver instruction at the beginning of the fourth month. We spent all of the first two weeks of the project identifying candidates for our four instructor/curriculum developer positions. We had hoped and expected to have had candidates identified between the time we were notified of our grant award and the time that our grant period actually began on May 1, 1991. This was one of the three tasks for which our business partner, the Private Industry Council (PIC), was responsible. However, when we interviewed the two candidates referred to us by the PIC, neither was found to be qualified. The challenge of finding candidates was more than they could handle so we were faced with starting our search from scratch. By intense networking, we were able, in only two weeks, to identify four outstanding candidates.

Another reason for the delay of start-up was a direct result of the poor economic climate in the country at the time we began this project. Two of our three businesses were in the throes of announcing layoffs or at least of addressing rampant rumors of impending "downsizing." The resultant fear on the part of many employees created an even greater need to sensitively approach the rationale behind our instructional program. The employees did not know that we had been meeting with HRD representatives at the three companies for over a year, waiting to hear about our grant award for nine months between the time we sent in our application on July 13, 1990, and when we received notification of award in March 1991.

To the employees, it looked strangely suspicious that threats of layoffs were surfacing the very same week that strangers were coming in to do some "assessments" that they were assured would have no relation to their future job security!! We did not blame the employees in the least for being doubtful of our and their company's motives.

Another reason for delay was that just about the time we were targeting to begin classes, TI was focusing all their energies toward the Malcolm Baldridge Award process. This necessitated delaying the start-up of classes until that flurry of activity passed. Even though TI was not selected for the award in 1991, the experience of having applied previously served them well, since TI received the Malcolm Baldridge Award in 1992. ***Appendix D*** features articles that appeared in the Austin newspaper announcing the award to TI and a thank you from one IBM plant to the Austin ECAT (Electronic Cart and Test) Team for their contribution to a new product. The ECAT plant is the one for which we provided our program. Also included in Appendix D is an article reflecting how the economy was affecting IBM in general and IBM Austin specifically.

In summary, the three-month start-up specified in the grant was not sufficient for all of the reasons stated above. We applaud what we have heard is the new, more realistic six-month start-up period now being allocated to grantees.

Objective IIIb: Design and implement record-keeping, evaluation, and documentation systems.

The design, process, data, and analysis of results of the record-keeping, evaluation, and documentation systems built in to this project are presented in the External Evaluation Report by Jorie Philippi that is being submitted with this Performance Report.

Goal IV: Implement a workplace literacy program by specifically identified job tasks at Hart Graphics, IBM, and TI.

Objective IVa: Recruit employees for production-related workplace literacy skills instruction.

At two of the companies with whom we worked (TI and Hart), both initial assessment and classes, if deemed necessary on the basis of initial assessment, were mandatory. Thus, recruitment was not an issue. At IBM, on the other hand, **both** initial assessment and instruction were voluntary. Several awareness sessions were held for managers and production workers in order to acquaint them with the purpose behind, content, and format of our program for the dual purpose of awareness and recruitment. As mentioned earlier, however, our arrival on the scene at the same time rumors of the first layoffs in IBM history were surfacing, did not lay the best foundation for recruitment. The delicacy with which we and IBM training and personnel department staff wanted to present the program and allay fears was responsible for some of the start-up delays discussed earlier in this report.

It is notable, however, that even with the understandable hesitancy to become involved in our program at such a relatively tenuous time in IBM employee lives, 51 persons still chose to come forward and volunteer for classes after assessment indicated that they could benefit from our program. The 51 students were still much less than the 75 participant goal we had for provision of services to IBM. It should be noted, however, that after the program was in full implementation for several months, feedback from several employees and managers was that, because of the positive word-of-mouth from many of the students in our program, more employees would come forward for future educational opportunities we provided.

Even though, as indicated, recruitment was not an issue at Hart or TI because instruction was mandatory, we still were not able to serve as many workers at TI as the 125 we had originally proposed. We were only able to provide classes for 55 employees at TI because of the difficulty of taking more than that number off the production line at a time, given the shifts the targeted students were on.

Hart also had difficulty taking workers off production. However, we were able to serve 28 of the 30 we proposed to serve because Hart paid overtime wages in order to make up the lost production time. This resulted in their having to expend a great deal more than they had originally budgeted for straight release time.

Objective IVb: Schedule class sessions and times for the workplace literacy instruction.

Working out a schedule agreeable to the three companies and our four instructors proved to be one of the greater challenges of our start-up period. This task was coordinated by our Private Industry Council business partner. A workable schedule was finally worked out after much negotiating and a final meeting with all interested parties attending.

Our class schedules served all three shifts at the two of our three companies (TI and Hart) that operated 24 hours a day. We designated one of the four instructors as our third shift instructor. Her schedule included the unenviable task of teaching a class twice a week from 1:30 until 3:30 a.m.

Coincidentally (not having anything to do with her schedule), this is the only instructor who did not work out. The instructor we replaced her with changed the schedule so that her latest class was taught from 11:00 p.m. to 1:00 a.m. twice a week.

Objective IVc: Identify potential program participants, determine literacy relative to required skills level, and enroll selected adult learners in the workplace literacy skill instruction program.

Just as we feel that the advice given us by the consultant who was training us to conduct the task analyses could have been improved by not advocating to just observe three exemplary workers for each type of job, we felt that the advice regarding determining literacy by just using one cloze reading passage was incomplete.

The traditionally accepted scoring of a cloze reading passage dictates that any word other than the <u>actual</u> predetermined word or one that is <u>identical</u> in meaning should be counted as an error. We decided that common sense precluded such rigidity. Instead, we decided to count any word that made perfectly good sense in context within a blank.

Also, in order to gain a broader perspective on the needs and ability levels of our potential program participants, we strongly felt the need to assess more than their ability to fill in correct words in the blanks within a reading passage.

For this reason, we used a cloze passage to assess reading but also added our own math assessment, made up of ten math items customized to each company and based on the math skills we saw being used during our task analyses. We also included a brief writing sample.

Not only did we find that our math items were the most discriminating sections of the entire assessment, but we felt that in developing future assessments for identification of potential program participants and placement into instruction we would develop different types (other than the cloze) of reading comprehension items. Now that we have begun to serve other companies since our DOE grant ended on January 31, we have put this assessment philosophy to work and have found it to work very well for our purposes. By definition, a demonstration grant is one in which grantees are charged with creatively trying new approaches to see which ones work best. To rigidly adhere to any one set of guidelines for how to do a workplace education program component, whether in the task analyses, assessment development, or teaching, seems to fly in the face of the very purpose of a demonstration grant. Thus, we, as experienced educators, opted to use our experience, varied areas of expertise, and common sense to approach the tasks that made up our workplace education program. Results, both formal and informal, seem to bear out the soundness of most of our decisions.

Objective IVd: Evaluate adult learners and develop an Individualized Education Plan for each.

The evaluation of our adult learners was discussed under Objective IVc above. We individualized instruction in two ways. First, from an overall perspective, only those employees for whom our program was appropriate and who could benefit from our program were tapped to be in them, so by definition, our classes were individualized according to their needs. Second, our classes utilized varied modes of instruction, including large group (no class had more than 15 students, and very few were even close to that number, with an average of 8-10 students). In addition to large group (i.e., whole class), we utilized small group instruction, peer tutoring, and one-to-one instruction. It was in this latter method that the Individualized Learning Plans came most clearly into focus.

When indicated, students were given supplementary instruction beyond what was in our lessons in order to meet their individual levels of need and ability.

Objective IVe: Provide enrolled learners with appropriate workplace literacy skills training.

The lessons that were being developed concurrent with their being field-tested with the participants in our Skills Building for Tomorrow Program met this objective. As stated earlier in this report, the lessons were modified to make them even more appropriate when circumstances dictated after field-testing.

That the curriculum materials we developed were highly correlated to what the participants needed on their jobs is evidenced by the fact that 96% of the TI participants, 91% of the IBM participants, and 61% of the Hart participants said they have used on the job what they learned in class. The lower figure for the Hart participants is chiefly attributable to the fact that the bindery employees typically had less use for as wide a variety of basic skills in their jobs as did the production line workers at the two high tech companies.

In very large measure, we feel that the instructional materials are highly effective because of the experience and expertise of the four developers. Their depth and breadth of experience in curriculum development and teaching shows through in every facet of the materials. They were given free rein to create materials that their experience as teachers told them would be most useful to the population for which they were designing them and most usable for other instructors who would be using them without the benefits of having developed and field-tested them. Their involvement was encouraged and sought in every aspect of the development of this project, from the skeletal outline of the content, all the way down to details like format, binding, titles, artwork, etc.

To solidify as much understanding and retention as possible, the instructors also decided that it would be best to provide a two-week review after all classes were over. This approach was particularly well received by the learners, especially since after eleven months of instruction, they felt the need for a refresher in those areas addressed early in the program.

Objective IVf: Evaluate adult learners to determine effectiveness of program.

SBT staff spent many months with all three companies and our external evaluator trying to determine what indicators would/could determine evidence of effectiveness of our program. This discussion began before we even received notification of our grant award and continued until well into the summer of 1992.

The problem in collecting meaningful data was that all three of the companies, as is becoming more and more the norm nowadays, were evaluating performance, not on an individual basis, but on the basis of teams or departments. This data collection was not appropriate for our purposes to ascertain program effectiveness because very few members of any one team or department were those who happened to be participating in our workplace education program.

It was finally agreed that the meaningful data that was possible for the companies to collect on an individual basis were (a) attendance, (b) turnover, and (c) safety.

We found **highly significant differences** in accident rates. We feel that safety figures are especially important in light of the information contained in the September 7, 1992, edition of *Adult and Continuing Education Today* that " estimates from the September 16, 1991, issue of *Time* magazine are that **more than 10,000 American workers die each year from on-the-job injuries--about 30 every day."**

At TI, 21% of the total number of workers (our participants) in the department in which we provided our program had 8% of the injuries. 79% of the total (nonparticipants) had 92% of injuries.

The safety statistics at the other two companies showed similar trends. At Hart, with equal numbers of participants and nonparticipants, the nonparticipants had nearly twice as many accidents as the participants did.

All we were able to say about IBM groups is that there were no accidents among the participant group. They were unable to provide us with the number of accidents, if any, in the nonparticipant group because of the high degree of flux among departments with reorganizations.

We found no statistically significant differences in the program participants and the nonparticipants in attendance or turnover at Hart and IBM. At TI, however, none of the participants left, whereas there was a 6% turnover rate among the nonparticipants. According to Dave Morris, TI's person in charge of PWB training, "any time you get a group of employees that size that doesn't have any turnover in a year's period, that's significant!"

Learner evaluation data that analyzed pre- and posttest scores on the material covered in our classes was reported in the Evaluation Report submitted by our external evaluator.

In addition to the comparative data on attendance, turnover, and safety, pre- and posttest scores, the pre- and post- program supervisor rating scales, and the post-program participant surveys all reported on in the Evaluation Report, we also maintained anecdotal reports throughout the program as significant events occurred that served to document student progress. Some examples of these 90 anecdotal reports are the following:

* "This student said that, in the past, she would just sit in quality circles and let everybody else figure the problems out. Now she finds that this lesson (on creativity) is helping her to speak out more in quality circle."

* "This student demonstrated resentment about being in the program on a number of occasions....During the last two weeks of class, she said that this program was the best thing that Texas Instruments had ever done for her during her ten plus years of employment."

* "This student stayed after class one day for thirty minutes to talk about how much the lesson on assertiveness was helping her in her life. She said it was like the lesson was written for her."

* "This student went from being quiet to being an active participant and leader during the team building module. His entire behavior changed from introverted to extroverted."

* "Holly, I got to do exactly what we are studying. The other day in a meeting, I asked a question and my manager said, 'O.K., you research it and write it up!' So, I did just like we studied in here."

* "I hope everyone is going to take this *(team building module)*. We're going to self-directed work teams and I think this is really important."

* "Well, I'm glad to finally see how that metric stuff works. You know we use it in our scopes everyday and I never did really know what it was."

* "I did this the other day. I'm really glad we just went over it because I knew just what to do." *(referred to memo writing)*

* While doing a lesson on fractions, the learner said, "I have been guessing all these 37 years *(with the company)*. Now, I really don't have to guess anymore!"

* "This learner brought me a variance report and then showed me how he now understands after all these years."

* "After the lesson on 'Following Instructions,' this student took me to his work station and showed me how he had rewritten instructions for his machine."

* "This (deaf) student said, 'I have never been confident enough to write my boss memos. Now I write them all the time and feel soooo good.'"

* "D. L. said skimming and scanning techniques had been a big help to him when using the company computer system."

* "A. R. was delighted with the simple formula she was given for calculating percentages. She checked it with me, using real examples from the Orange Line. She was very excited when she discovered how easy it was to calculate. 'I can use this every day!'"

* "R. C. said he had taken an SPC class, and that the math learned in SBT had been extremely helpful. 'Everything just clicked, because of what I'd done in this class.'"

* "L. B. used skills gained in SBT to calculate her average hourly output of boards and tell her manager how long it would take her to finish 300 boards."

* "B. L. said that about halfway through the course, she became more assertive and began following through when she saw problems, instead of just telling the lead technician and leaving it at that."

In addition to the quotes above from the anecdotal reports, we sought and were granted permission from two of our program graduates to use their quotes in our brochure in Appendix C.

We also collected pre-and post-program writing samples. These, for the most part, showed tremendous progress. We, on the Skills Building for Tomorrow Project, felt that the tangible demonstrations of improved competence in areas that were important to their jobs, as reflected in the writing samples and the anecdotal reports, were every bit as important, if not more so, than the more formal pre-and posttest scores we collected that were reported on in our external evaluator's Evaluation Report. We feel that softer data, such as that collected to document gains in the softer skills we were teaching (e.g., problem solving, decision making, team building, etc.), are appropriate, recognized, and valued by program implementers and employers and should be more recognized and valued by funding agencies. However, we recognize that it is more difficult to provide justification for continued funding if softer data, no matter how truly significant, are all an employer has to show the management of a company charged with making hard fiscal decisions, particularly in times of economic downturn.

Goal V: Evaluate effectiveness and efficiency of the program (and its attendant objectives):

Objective Va: Maintain accurate and sufficient records as a data base for evaluation, and analyze the records to determine program effectiveness

This objective is addressed in detail in External Evaluator Jorie Philippi's Evaluation Report. However, I would like to add a few additional bits of information related to this objective.

We maintained an Internal Evaluation Plan for the project. This included (1) **weekly staff meetings** during which we evaluated the general progress of the program and the specific strengths and weaknesses of lessons taught during the previous week and what revisions needed to be made for the final product, (2) monthly (then bimonthly) **Advisory Committee meetings** with all SBT staff and several representatives of all three companies, (3) **weekly time sheets** which were particularly important for U. T.'s internal accounting since, except for our weekly staff meetings, the teachers were always off campus, either teaching on site at one of our three companies or developing curriculum out of their homes on personal computers on loan to us from IBM, and (4) **production schedules** that allowed me, the instructors, and our production staff to keep track of exactly where, in process, a particular lesson was on any given day. Without this system, the logistics of coordinating the writing, production (including editing, inputting into the computer, and designing artwork), duplicating, field-testing, and revising fifty-four lessons would have been much more difficult than it was, particularly in light of the fact that we were producing the lessons approximately three weeks ahead of the time when they were taught in the classes.

In the reporting requirements that we received from DOE at the beginning of our grant, a request was made for a report on the "number and characteristics of project participants who completed planned project activities and of those who did not...." The Evaluation Report submitted from External Evaluator Jorie Philippi included the demographic characteristics of the program completers at each of the three companies with whom we worked. Because both Hart and TI mandated that our program was required, the only employees we lost from those two companies were the few who retired and/or took early retirement.

At Hart Graphics, three participants terminated their employment, one was excused from classes because she was nearing retirement, one was promoted to supervisor, and two did not want to be mandated and raised enough of a furor to be excused by the training manager.

At TI, only one employee was excused from class. He was a supervisor who felt that he should not be in a class and was such a disruptive influence that he was excused.

Because IBM's program was voluntary, we lost several more IBM employees than at the other two companies. The following represent the reasons for their withdrawal:

* Five employees opted for IBM's early buyout plan (ITO) and retired.

* Five employees became so busy with their regular work that they did not return to class after varying lengths of time in the program.

* Two employees were placed into a "Leadership 90" class, a prerequisite for promotion to supervisor, which conflicted with our scheduled classes.

* One employee seemed to lose interest.

* One employee placed out of the first three modules. When employees were not given the option of placing out of the last two modules, this employee dropped out.

* One employee dropped out after a disagreement with her instructor.

* One employee became seriously ill in the middle of Module 3 and never returned to class after returning to work.

* One employee was transferred out of the plant where the program was offered.

* One employee's manager was believed to be less generous than others about giving him the time to attend class.

* One employee had definite learning disabilities. The instructor did not have the heart to take him out of the class. He got mired in Module 3 *(Advanced Math)* and stopped attending.

Objective Vb: Make program usable for replication industry-wide.

This objective, too, is addressed in Jorie Philippi's External Evaluation Report. However, I would like to add one thought about making the program usable for replication industry-wide.

As mentioned earlier in this report, our goal in producing our instructional materials was twofold. We wanted to develop a curriculum that was relevant to the needs and jobs of the employees of the three companies who were our partners in this grant. We also wanted to develop a curriculum that could be generalized to a wider population so that it would be practical to disseminate the final product throughout the country. We feel that we have met this dual objective.

That our materials are usable for replication industry-wide is being evidenced as I write this when we see how appropriate our materials are for the high tech production line workers we are serving through our workplace education program at XeTel Corporation, an Austin company that assembles circuit boards and does very similar production line tasks as the employees we served through our grant at IBM and TI.

Related to replication of the program, one of the evaluation questions we asked participants, after they completed our program, was how they would change the program. The following are all of the responses that were mentioned by more than one person:

* Keep all the math together (2 respondents) *(We made this change.)*
* Went too fast; needed more time, especially for math (9 respondents) *(We added more time for math lessons by consolidating some lessons.)*
* Include spelling and handwriting (2 respondents) *(We added spelling hints as one of the "Tools of the Trade" in our books.)*
* More math (2 respondents)

* More work-related (2 respondents) (NOTE: This comment, made by two employees of the printing company, probably reflected their response to some of the examples and exercises that related more to application of skills in a high tech context than to the bindery operation.)
* Shorten it (3 respondents) *(See paragraph below.)*

At the Start-Up Conference in May 1991, DOE asked for a show of hands for how long each project's classes were projected to run. Ours was the longest with us serving all of the participants for a total of 200 hours We proposed this because sound instructional practice necessitates programs of instruction that are longer than "quick fixes." We felt that the 200 hours was a realistic length of time in which to reasonably expect to make a positive impact on our participants' instructional levels. Reality dictated, however, that we reduce the 200 hours to 160 because, even with that reduction, we were only able to serve 55 of the 125 we initially proposed to serve at TI. It was not until we began to schedule classes that reality struck regarding the production and release time expense implications of having 125 workers off the line on company time for such an extended period. Thus, at TI, we assessed 236, proposed to serve 125, and served 55.

At **Hart Graphics**, we assessed 71, proposed to serve 30, and served 28.

At IBM, we assessed 111, proposed to serve 75, and served 51. We fell 24 workers short because participation in instruction at IBM was voluntary. Later in the program, as previously reported, several IBM employees expressed to our instructors, their supervisors, and to internal training staff that they wish they had taken advantage of the opportunity when it was offered to them and that they certainly would participate if they were offered another opportunity. We believe that this change in attitude was caused primarily by them having heard through word-of-mouth how useful and job-related the program was, the excellent rapport the instructors established with the participants, and the fact that their participation in the program had no negative impact on their position with the company.

Dissemination Activities

DOE also requested that we report on any dissemination activities.

Throughout the twenty-one months of the project, we took advantage of several opportunities in which to disseminate information regarding our project. These are summarized below.

* Austin Mayor Bruce Todd established the "Mayor's Coalition for Workplace Literacy." Hart Graphics' Training Manager Cheryl Bingham and SBT Program Director Elaine Shelton were asked to serve as members. Bill Demestihas, Executive Director of our business partner, the PIC, and several IBM training department employees were involved since the Coalition's inception.

* Elaine Shelton has become involved with the "Austin Industry Education Council," representatives of the training departments of many of the larger businesses in Austin that meet regularly with representatives of the city's three major workplace education service providers and the Austin/Travis County Private Industry Council to discuss the companies' needs and the education providers' capabilities.

* On April 11-14, 1991, Elaine Shelton attended the annual Commission on Adult Basic Education (COABE) Conference in Bismarck, North Dakota. She disseminated information about the SBT program and attended several informative sessions on workplace education. One of the most interesting was the session conducted by DOE's Ron Pugsley on the findings of DOE's Closeout Conference that took place at the end of the second wave of National Workplace Literacy Program grants.

* On August 13, 1992, Ms. Shelton made a presentation on the SBT Program to approximately 60 members of the "Job Service Operations Forum" of the Texas Employment Commission.

* On September 14, 1992, Ms. Shelton made a presentation on the SBT Program at the monthly meeting of the Austin chapter of the National Society for Performance and Instruction (NSPI). The invitation was extended by Nancy Jokovich and Gaye Arnold, both NSPI members employed in TI's training department, with whom we worked on the SBT Program.

* In the fall of 1992, Bill Demestihas spoke at the National Alliance of Business Conference in Miami on the PIC's role in workplace literacy and the SBT Program.

* On November 5, 1992, Elaine Shelton presented a session titled, "Valuable Lessons Learned from the Project from Hell" at the annual conference of the American Association for Adult and Continuing Education (AAACE) in Anaheim, California.

The title was derived from what I feel were among the most trying seven months of my life_the first seven months of this workplace education project. I am happy (and relieved) to be able to honestly report now, from the perspective of having satisfactorily worked through the entire twenty-one months of the project, that the project staff feels very positive about the outcomes we were able to achieve through our instructional program and delivery and the positive changes we have seen in the participants of our program. We have all gained much in experience and expertise which has put us in a very good position to continue to provide workplace education services to additional business partners.

We feel that we have used the opportunity, both the experiential time and seed money, that the National Workplace Literacy Program afforded us to learn an incredible amount of highly useful and transferable information.

We feel that one of the goals of the National Workplace Literacy Program is to provide a nurturing incubator for the generation of effective workplace education concepts and materials that, once developed, enable the developers to become independent of the federal funds and become more self-supporting with the direct investment of the businesses who will become the new recipients of the program.

We feel that we now have the experience to fly from the nest of federal funding on our own as we contract directly with businesses to provide instruction using the curriculum that we developed through the DOE grant. It is doubtful that without this substantial support we received from the grant that we would have even been able to find a consortium of companies able to take on the costly burden of curriculum development.

With that time-intensive, and therefore costly, part of the program accomplished, it is now reasonable to look to businesses to pay for the instructional program which has proved effective. It is this hypothesis that we are now testing and is the reason, after having implemented a highly successful workplace education program, that

we did not apply for additional federal funds during the most recent application period.

Recognition Events

Most people like to be recognized for their achievements, and we felt that to have progressed through an eleven-month instructional program, albeit on company time, was indeed an achievement. Thus, each company arranged some type of recognition event for the program completers.

Each company chose to recognizė the program's completion in different ways. TI treated each separate class (all five of them) to a dinner at the restaurant of the class's choice. IBM invited honorees to a complimentary "walk-thru" in the company cafeteria and then treated them to a "build-your-own" ice cream sundae in a private dining room where certificates of completion were issued. Hart treated all of their participants to a Texas barbecue dinner at a popular local restaurant.

Making sure that we practiced what we preached, the U.T. program staff also recognized program graduates in a tangible way by providing each with a certificate of completion that featured the person's name in calligraphy. The certificates called for signatures of the site training directors, the participant's instructor, and the Director of the SBT Program. TI generously provided the parchment upon which the certificates were printed. A copy of the certificate awarded to participants of all three companies is included in ***Appendix E***, along with the celebration notices from Hart and IBM.

We also provided Certificates of Appreciation to each member of the SBT Advisory Committee. To celebrate the completion of the SBT classes, we held an "in-house" celebration on October 1, complete with chocolate cake that was made to look like our Certificate of Appreciation. A photo of the cake is also included in Appendix E.

The recognition and acknowledgment of a job well done was not a one-way street. To thank them for excellent teaching over the year-long classes and symbolic of the outstanding rapport each instructor established with her students, each instructor was given gifts of thanks from her classes.

At the beginning of this report, I quoted External Evaluator Jorie Philippi's praise for the exemplary quality of this project. Looking back from the vantage point of the past twenty-one months, when the successes of the last fourteen months managed to outweigh the rigors of the first seven months, I can appreciate more the words of the great abolitionist and former slave, Frederick Douglass, who stated: ***"If there is no struggle, there is no progress. Those who profess freedom yet deprecate agitation, are men who want crops without plowing up the ground; they want rain without thunder and lightning. They want the ocean without the awful roar of its many waters."***

Douglass' quote aptly sums up the first seven months of Project LitE. We had much agitation, spent many laborious hours "plowing up new ground," and frequently felt as though we had been struck by lightning. The sometimes strident voices of the members of our advisory committee could occasionally be likened to the "awful roar" of which Douglass spoke.

That the project ended with feelings of success and a job well done, however, is attested to by the testimonials in our brochure from the liaisons at all three companies with whom we worked on this grant.

I will close this report with one more quote, this one from Marilyn Ferguson whose statement that appeared in *Organizations in Transition* reflects, in my opinion, one reason why the first several months of this project were so difficult: ***"It's not so much that we're afraid of change, or so in love with the old ways, but it's that place in between that we fear....It's like being in between trapezes. It's Linus when his blanket is in the dryer. There's nothing to hold on to."***

To a large extent, this statement sums up the trepidation most of us feel when confronted by change, even change that we perceive may be good for us. This project has been an incredibly rich learning experience for <u>all</u> of us. Indeed, those of us on the project staff have often felt that we have learned every bit as much, if not more, as the student/employees whose learning gains were the first priority of this project.

APPENDIX A
ADVISORY COMMITTEE

(not included)

APPENDIX B

MATCHING FUND REPORTS

(not included)

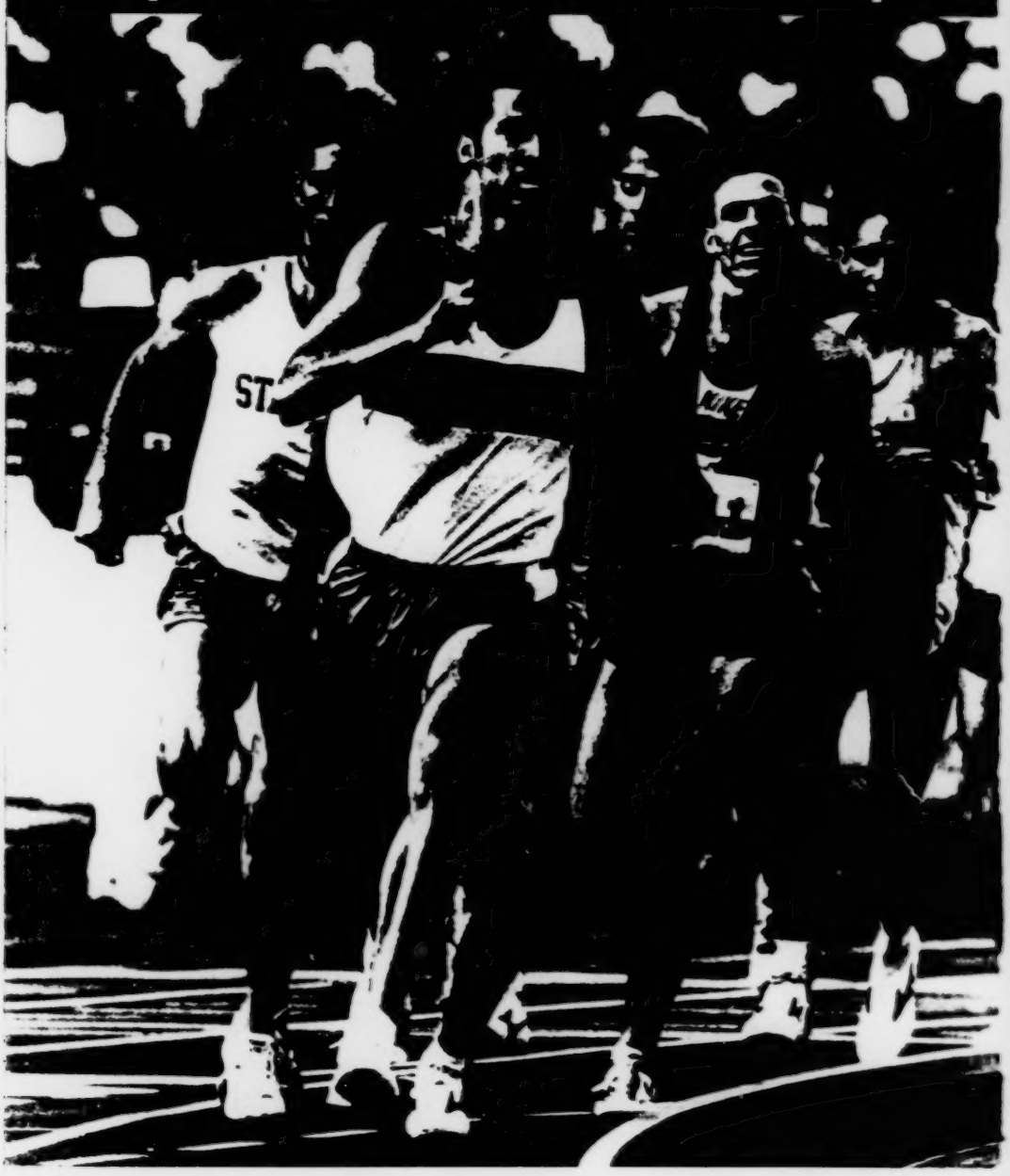
APPENDIX C

PROMOTIONAL BROCHURE

APPENDIX C

The Competitive Edge

Sharpening Skills in the Workplac



THE UNIVERSITY OF TEXAS AT AUSTIN
Extension Instruction & Materials Center
EDUCATIONAL RESOURCES

BEST COPY AVAILABLE

"The education and skills of the work force is the chief competitive weapon...and when I talk about a well-educated work force, I'm not talking about the college part of the crowd....Modern industrial armies travel, based not on how good the generals and admirals and colonels are, but on how good the privates and corporals are."

Dr. Lester Thurow
Dean of MIT
Sloan School of Management

"Regarding 'Skills Building for Tomorrow' [the name of the UT Pilot Program], I remember a quiet and shy person who would rarely speak. As I observed her interact with the team, I saw someone making suggestions and taking an active role in the ensuing discussion. This type of change is not easily quantified but does in fact impact the bottom line."

Sam Zigrossi
Regional Manager
Skill Dynamics, IBM Company

"That's what I liked about the course, I could always compare it with my job in some way or other."

Linda Geesling
TI employee & program graduate

"Because of the program, I am now offering suggestions or solutions to problems without wanting 'my way' all the time. Accepting the better and most efficient solution—no matter who thought of it...also paying attention to my voice and body language in thought, word, and deed concerning my job duties."

Lydia Hinojosa
IBM employee & program graduate

Cover photo: Larry Pierce, The University of Texas Athletic Photography
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The University of Texas at Austin is an equal opportunity institution.

Employers want workers who can keep up with new technology and an ever-changing work environment.

Employees want to develop and maintain the skills necessary to make them valuable to the company.

Sound familiar? You know the statistics. The skills your workers need today may be radically different from the skills they need tomorrow. Yet, you can't send them all back to school. As a result, workplace education has become one of the fastest-growing and most effective ways for companies like yours to strengthen the skills needed by today's workforce.

The University of Texas at Austin has designed *The Competitive Edge: Sharpening Your Skills in the Workplace* to help your employees develop the skills that will maintain their value in your company. Originally funded by a 21-month grant from the U.S. Department of Education's National Workplace Literacy Program (1991–1993), this program contains a comprehensive curriculum that was extensively field-tested in yearlong classes held at IBM, Texas Instruments, and Hart Graphics located in Austin, Texas.

Do you need assistance raising the level of your workers' skills? Our program can help. Here's how.

The Competitive Edge program offers a curriculum that addresses math and communication skills **applied** to a workplace context. In addition, we can provide the technical assistance needed to begin a workplace education program for your organization. Both components of the program are available separately or together as a package.

Curriculum Correlated to SCANS Skills

The Competitive Edge emphasizes the basic skills and thinking skills reported to be essential for workplace preparation by the Secretary of Labor's Commission on Achieving Necessary Skills (SCANS).

With content areas in both math and communications, *The Competitive Edge* addresses not only the more conventional communication skills of reading, writing, speaking, and listening, but also the critical skills of problem solving, decision making, and team building so essential to your company's success. Skills are taught in the context of your workplace setting, and the easy-to-use format readily lends itself to adaptation to your special needs.

Student Edition Features

- Functional workplace context
- Discrete modules, each containing daily lessons
- Stated learning objective for each lesson
- Vocabulary sections for terms that need explanation
- Numerous practice problems
- Lesson supplements ("Tools of the Trade") that include practice reviews on grammar, spelling, and more
- Visual cues for recurring lesson segments provided by icons
- Answer Key at the back of the book

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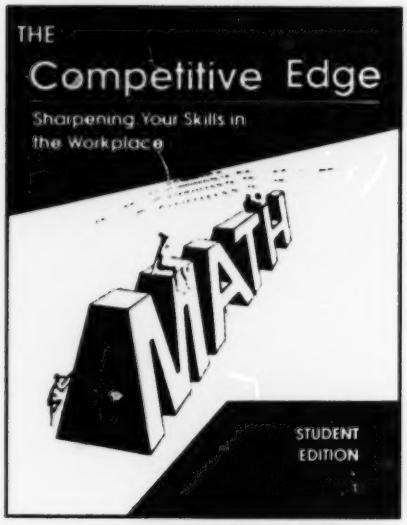
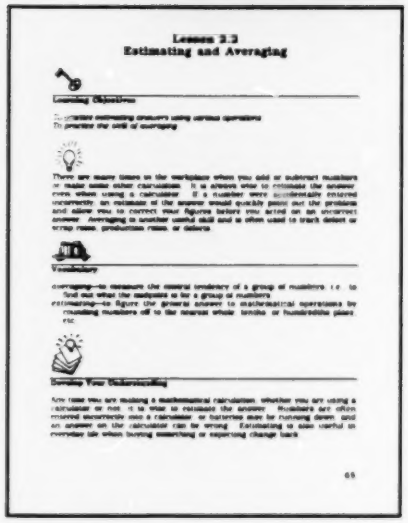


Math Skills

- decimals
- fractions
- estimating & averaging
- ratio & proportion
- percents
- measurement
- signed numbers
- solving for the unknown
- charts & graphs



Lesson 2.3
Estimating and Averaging

Learning Objectives

To practice the skill of averaging

There are many times in the workplace when you add or subtract numbers or make some other calculation. It is always wise to estimate the answer mentally when using a calculator. If a number were accidentally entered incorrectly, an estimate of the answer would quickly point out the problem and allow you to correct your figures before you acted on an incorrect answer. Averaging is another useful skill and is often used to track defect or scrap rates, production rates, or returns.

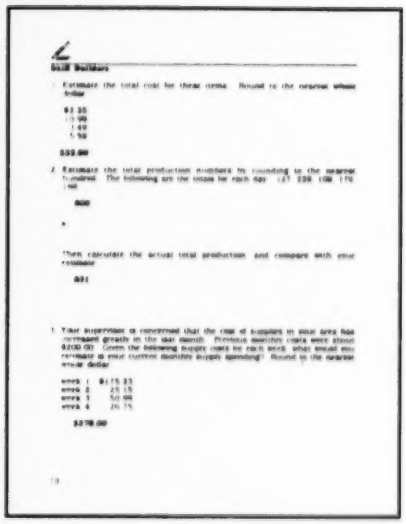
Vocabulary

averaging—to measure the central tendency of a group of numbers; i.e., to find out what the midpoint is for a group of numbers

estimating—to figure the general answer to mathematical operations by rounding numbers off to the nearest whole tenths or hundredths place; etc.

Develop Your Understanding

Now that you are making a mathematical calculation, whether you are using a calculator or not, it is wise to estimate the answer. Numbers are often entered incorrectly into a calculator, or batteries may be running down, and an answer on the calculator can be wrong. Estimating is also useful in everyday life when buying something or reporting change back.



Skill Builders

1. Estimate the total cost for these items. Round to the nearest whole dollar.

$2.35
1.99
1.49
1.59

$7.00

2. Estimate the total production numbers by rounding to the nearest hundred. The following are the totals for each day: (21 238 198 175 ...)

600

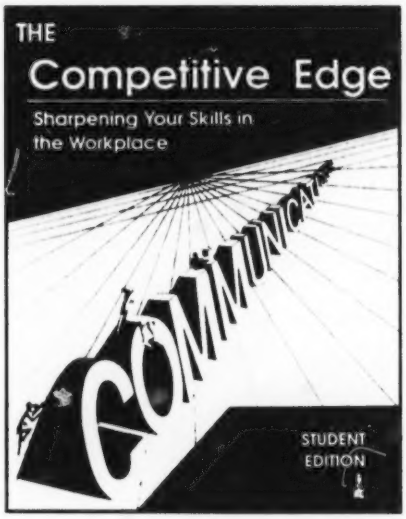
Then calculate the actual total production and compare with your estimate.

601

3. Your supervisor is concerned that the cost of supplies in your area has increased greatly in the last month. Previous months' costs were about $200.00. Given the following weekly costs for each week, what would you estimate is your current monthly supply spending? Round to the nearest whole dollar.

week 1 $175.23
week 2 25.15
week 3 50.99
week 4 26.75

$278.00



Communication Skills

- speaking
- listening
- reading
- writing
- problem solving
- decision making
- team building

Lesson 1.7
Working with Tables and Graphs

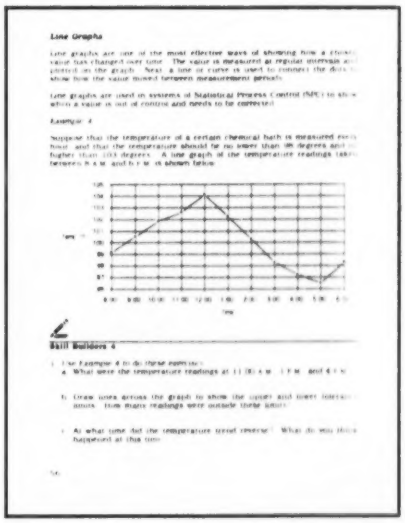
Learning Objectives

To review the major types of tables and graphs used at work
To practice interpreting the information presented in tables and graphs
To practice constructing tables and graphs to display information

Vocabulary

Try This

Look at the graph on the next page and answer the questions that follow.



Line Graphs

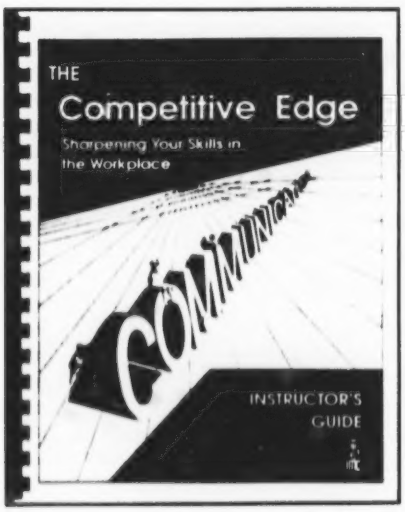
Example 4

Skill Builders 4

1. Use Example 4 to do these exercises.
   a. What were the temperature readings at 11:00 A.M., 1 P.M., and 4 P.M.
   b. Draw lines across the graph to show the upper and lower tolerance limits. How many readings were outside these limits?
   c. At what time did the temperature trend reverse? What do you think happened at that time?

Program Implementation

How is the program implemented? You can't just send study materials to students and expect them to figure out the problems. And what you *don't* need is something that won't work. *The Competitive Edge* materials are designed to facilitate implementation at all levels: student, instructor, and administrator. Along with Student Editions, our program includes Instructor's Guides and an Administrator's Guide that make certain all the necessary people involved with the program are prepared to make it succeed.

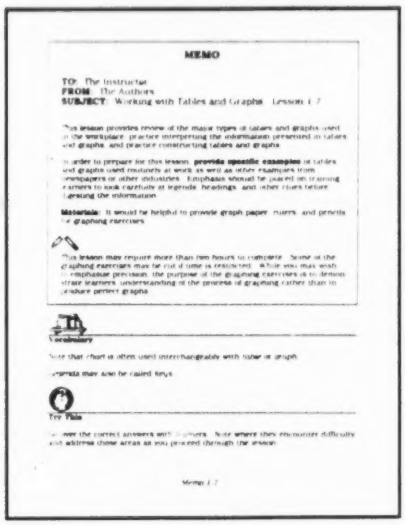


Instructor's Guide Features

- Complete text of corresponding Student Edition

PLUS

- Answers within text
- Teaching suggestions ("Memos to the Teacher") before each lesson
- Assessment instructions



MEMO

TO: The Instructor
FROM: The Authors
SUBJECT: Working with Tables and Graphs Lesson 1.1

This lesson provides review of the major types of tables and graphs used in the workplace, practice interpreting the information presented in tables and graphs, and practice constructing tables and graphs.

In order to prepare for this lesson, **provide specific examples** of tables and graphs used routinely at work as well as other examples from newspapers or other industries. Emphasize should be placed on training learners to look carefully at legends, headings, and other clues before guessing the information.

Materials: It would be helpful to provide graph paper, rulers, and pencils for graphing exercises.

This lesson may require more than two hours to complete. Some of the graphing exercises may be cut if time is restricted. While you may wish to emphasize precision, the purpose of the graphing exercises is to help those learners' understanding of the process of graphing rather than to produce perfect graphs.

Vocabulary

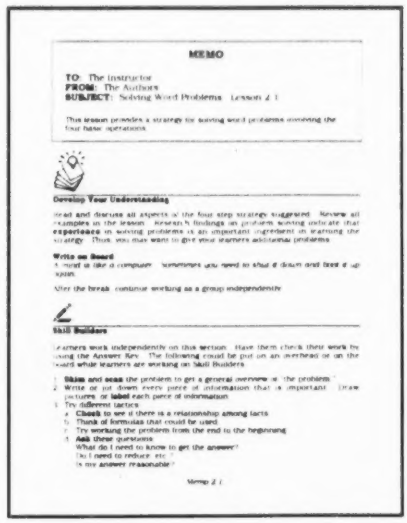
Note that chart is often used interchangeably with table or graph.

Legends may also be called keys.

Try This

Go over the correct answers with learners. Note where they encounter difficulty and address those areas as you proceed through the lesson.

Memo 1.1



MEMO

TO: The Instructor
FROM: The Authors
SUBJECT: Solving Word Problems Lesson 2.1

This lesson provides a strategy for solving word problems involving the four basic operations.

Develop Your Understanding

Read and discuss all aspects of the four step strategy suggested. Review all examples in the lesson. Research findings on problem solving indicate that **experience** in solving problems is an important ingredient in learning the strategy. Thus you may want to give your learners additional problems.

Write on Board

Remind learners to take a computer. Sometimes you need to shut it down and boot it up again.

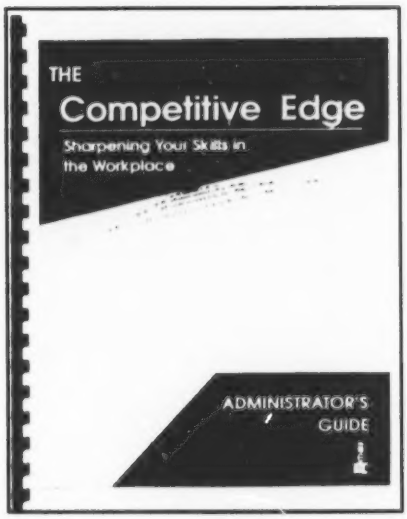
After the break, continue working as a group independently.

Skill Builders

Learners work independently on this section. Have them check their work by using the Answers Key. The following could be put on an overhead or on the board while learners are working on Skill Builders.

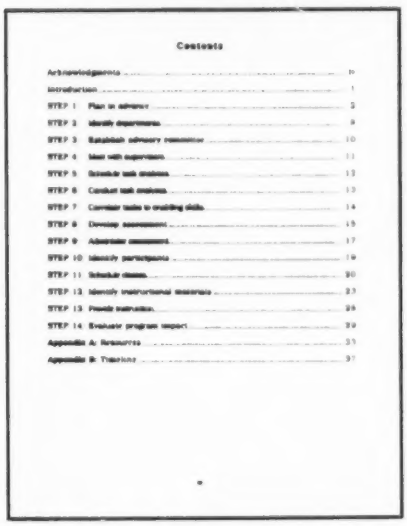
1. **Skim and scan** the problem to get a general overview of the problem.
2. Write or jot down every piece of information that is important. Draw pictures or **label** each piece of information.
3. Try different tactics.
   a. **Check** to see if there is a relationship among facts.
   b. Think of formulas that could be used.
   c. Try working the problem from the end to the beginning.
   d. **Ask** these questions:
      What do I need to know to get the answer?
      Do I need to reduce, etc.
      Is my answer reasonable?

Memo 2.1



Administrator's Guide Features

- Step-by-step reference for how to plan for and carry out a workplace skills enhancement program
- Timeline chart for planning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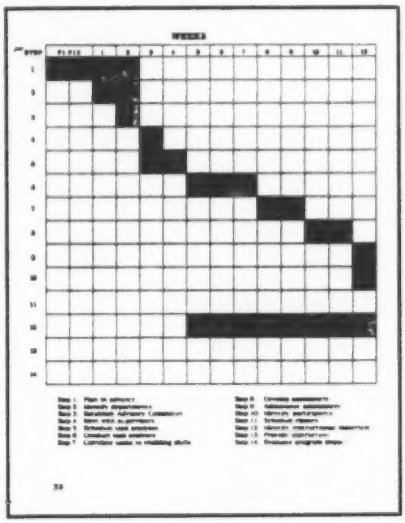

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